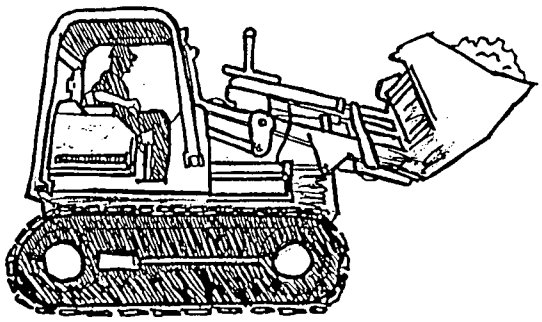

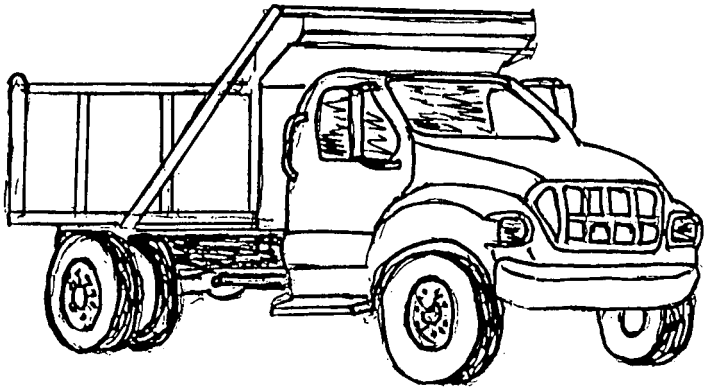

Pollution Prevention and Environmental Compliance

Guide on Sand and Gravel Removal

For

Landowners, Governmental Agencies

And

Commercial Operators

In Missouri

MISSOURI DEPARTMENT OF NATURAL RESOURCES
Technical Assistance Program
1-800-361-4827
www.dnr.state.mo.us

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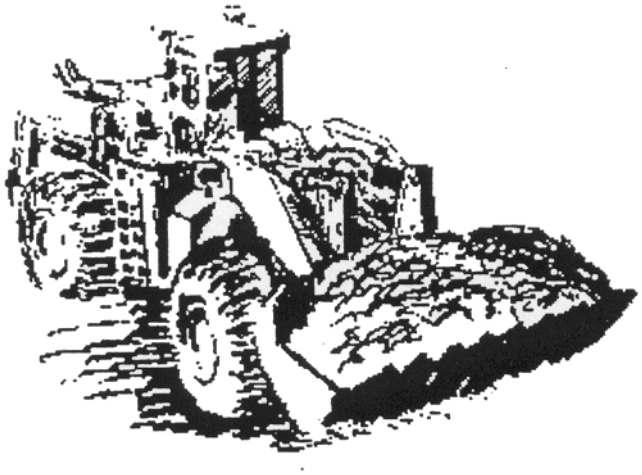
The information in this publication is intended as general guidance only. For specific requirements, the reader should consult the appropriate federal and state laws and rules.

Agencies that have contributed information for this publication are:

Department of Natural Resources' Land Reclamation Program
Department of Natural Resources' Water Pollution Control Program
Missouri Department of Conservation, Conservation Research Center
Missouri Department of Conservation
U.S. Army Corps of Engineers



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Technical Assistance Program
P.O. Box 176
Jefferson City, MO 65102-0176

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If you have comments or suggestions for ways to improve this guidance publication, please let us know by calling TAP at 1-800-361-4827 or write to:

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Technical Assistance Program
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Jefferson City, MO 65102-0176

Environmental Regulation Compliance and Pollution Prevention Guidelines for: Landowners, Government Agencies and Commercial Operators on In-Stream Sand and Gravel Removal

As environmental protection becomes more and more important across the nation, individuals are faced with some legal questions—

- Will environmental regulations apply to me if I want to remove sand and gravel from a stream on my property?
- Will I need a permit to remove sand and gravel from my stream?
- What are the correct procedures for sand & gravel removal that minimize negative impacts to water quality and aquatic life?
- How does the removal of sand and gravel effect the stability of a stream?
- How do I protect workers and myself from environmental hazards at my business?
- Who do I contact that can help answer these questions?

This publication can help landowners, government agencies and commercial operators, that want to remove sand and gravel from streams in Missouri, answer some of those questions. Each section provides basic information about how to properly remove material, permitting and regulatory requirements and suggestions for protecting yourself, your workers and the environment through pollution prevention.

These guides will not answer every question you have. After reviewing this guide you should be able to decide if you need more information or assistance on a particular issue. The Missouri Department of Natural Resources has a Technical Assistance Program (TAP) to help individuals understand and comply with environmental regulations in addition to finding ways to prevent pollution. If you need assistance, call TAP at 1-800-361-4827 or any of the other agencies listed in section III.

SECTION I

MINING

SAND & GRAVEL

IN

MISSOURI

SECTION I; MINING SAND AND GRAVEL IN MISSOURI;

Many Missouri streams contain abundant quantities of sand and gravel that are being mined conveniently and economically for a variety of uses. Unfortunately, when these minerals are extracted, water quality can be affected and the streambed and banks could become unstable. When this happens, aquatic habitats become reduced or eliminated from the stream and property located adjacent to the stream may also be physically damaged.

The stability of sand-bed and gravel-bed streams depends on a delicate balance between stream flow, sediment supply from the watershed, and stream channel form. Sand and gravel removal disrupts sediment supply and channel form that can result in a deepening of the channel over great distances upstream and downstream of the mine site as well as sedimentation of habitats downstream.

There are presently four primary methods for mining sand and gravel in Missouri;

(1) Bar skimming, in-stream (bucket loader)
(2) Floodplain pit mining (pit operation-dredge or backhoe)
(3) Pit operation (in-stream dredge or backhoe)
(4) Dredging, in-stream (rivers & larger streams)

Three of these methods, if done on a commercial basis, would require a permit from a regulatory agency. An in-stream pit operation (#3 method) is not an approvable practice and could be in violation of the Clean Water Laws of the State of Missouri. The regulatory agencies responsible for mining related activity are listed in Section III.

Bar skimming operation

This is the type of operation that many landowners, small commercial operators and government agencies use. The gravel is used for personal use, to sell, or use for county road construction in areas of the state where this type of gravel is available. Landowners may remove gravel on their property, for their own use **without** requesting a permit, but should follow the approved practices listed at the end of this section. Local governments are not regulated by the State **unless** a 404/401 permit is issued. They also need to follow the approved practices described at the end of this section to minimize negative impacts to water quality and aquatic life.

A bar skimming operation if done improperly increases flow width (Figure 2, page 11), produces slower stream flow velocities and lower flow energies, causing

sediments arriving from upstream to deposit at the mine site. The bar skimming practice would lessen the risk of mining-induced headcuts. However, this could cause a condition called “hungry water” and associated channel incision down-stream of mine sites.

“Hungry Water” is created when a bar-skimming operation creates a wider channel that results in a more shallow water flow (figure 2). This produces a braided flow or subsurface intergravel flow in riffle areas that restricts movement of fish between pools. As stream flow moves beyond the site and flow energies increase in response to the normal channel form downstream, the amount of transported sediment is now less than the sediment carrying capacity of the flow. This sediment-deficient flow or “hungry water” picks up more sediment from the stream reach below the site where the gravel was removed, furthering the bed degradation process. This condition exists until the balance between input and output of sediments at the site is re-established.

The bar skimming method could also cause other problems such as elimination of side channels, abrupt relocation of the low-flow channel and higher mobility of loosened sediments. Gravel-rich streams would be less susceptible to disturbance from this form of mining than would gravel-poor streams.

The department recommends using the bar skimming method to remove sand and gravel from a stream. The recommended practices are described at the end of this section. This practice when used in a responsible manner will help minimize the negative impacts to a stream while maintaining an important and viable industry.

Flood plain / open pit operations

Open pit operations are typically located in the flood plains close to larger streams and rivers. This type of operation is found in low-lying areas that have accumulated a large deposit of sand and gravel over a long period of time. A dredge, backhoe or dragline are the primary machines used to mine the material. These are generally large commercial operations that require a permit and bonding from the Missouri Department of Natural Resources’ Land Reclamation Program. If the material is being washed and the water returned to the stream, a permit from the Missouri Department of Natural Resources’ Water Pollution Control Program would also be required under Section 402 of the Clean Water Act. If material is re-deposited into waters of the U.S. or a defined wetland, then a permit is required from the U.S. Army Corp of Engineers (USACE) under Section 404 of the clean water act.

Open pit mining operators should also limit their operations to terrace locations that have an unmined, forested buffer between the site and the channel. It is recommended that this be a minimum of one hundred feet (100’) in width to reduce the risk of channel capture by the pit during flood flows.

Pit operation

Pit mining in an active stream channel is not an approved practice and has a profound negative effect on the physical and biological character of the stream. A pit operation if conducted by a commercial permitted or private unpermitted operation may result in the issuance of enforcement actions and liability for monetary penalties by the Missouri Department of Natural Resources' Land Reclamation Program and the Water Pollution Control Program.

A pit operation locally increases flow depth (figure 1, page 10), sedimentation is increased and the stream channel becomes unstable and inhospitable to most aquatic species. A pit created within an active channel lowers the streambed creating a "nick point" that locally steepens channel slope and increases flow energy. During high flows, a nick point becomes a location of bed erosion that gradually moves upstream in a process called "headcutting". A pit operation creates factors that increase or decrease sediment supply, often destabilize the streambed and banks and result in dramatic channel readjustments (figure 1). Loss of aquatic resources may result from head cutting, hungry water and increased sediment relocation. Costs to society (damage to public and private property) are the greatest in this type of removal as well.

Dredging

This type of operation is normally used on large streams and rivers such as the Missouri and Mississippi or a flood plain/open pit operation. A barge is used to auger the sand or use a large vacuum pump to remove the sand from the bottom of the river or pit and deposit it on an adjoining barge for transport to shore. In some cases the sand/water slurry may be pumped to shore through a floating pipeline, where the water is separated from the sand and returned to the stream or the pit.

The river operation would require a permit from the U.S. Army Corps of Engineers (USACE). If a U.S. Army Corps of Engineers permit is needed, then it will also need a water quality certification permit under Section 401 of the Clean Water Act from the department's Water Pollution Control Program.

How mining affects a stream's character

Stream channels transport sediments and water from headwaters to mouth, systematically depositing and eroding, abrading (wearing down by friction) and breaking sediment particles during the transport process. In gravel-rich streams, effects downstream of mining sites may be short-lived when mining ends, because the balance between sediment input and transport at a site can reestablish relatively quickly.

Activities that artificially lower streambed elevation cause bed instabilities that result in a net release of sediment in the local vicinity. The most widespread

effects of in-stream sand and gravel removal on aquatic habitats are bed degradation and sedimentation.

A pit operation locally increases flow depth (Figure 1) and a bar skimming operation increases flow width (Figure 2). Both methods produce slower stream flow velocities and lower flow energies, causing sediments arriving from upstream to deposit at the mine site. As steam flow moves beyond the site and flow energies increase in response to the normal channel form downstream, the amount of transported sediment leaving the site is now less than the sediment carrying capacity of the flow.

Effects of a gravel-poor stream may develop rapidly and persist for many years after mining has concluded. Regardless of downstream effects, headcutting in both gravel-rich and gravel-poor streams remains a major concern. Of the two forms of bed degradation, headcutting is more recognizable in the field and represents the greater risk to aquatic resources, stream bank instability and property destruction.

Sand and gravel removal guidelines that help minimize negative impacts to water quality and aquatic life

1. Restrict mining activities to bars containing primarily smaller material that is loosely packed (at least 85 percent of the material is less than three inches in diameter). Gravel bars that are covered with larger-sized material that is well packed (consolidated) and vegetated are relatively stable and should not be disturbed. Stream stability and health can be adversely impacted by disturbance of stable bars.

2. Gravel removal should not take place within 20 feet of streamside vegetation (greater than one and one-half inches in diameter measured at breast height or four and one-half feet). Sand and gravel removal for personal use should maintain an undisturbed buffer of at least ten feet in the areas specified in this condition. Width of buffer areas may be modified if an on-site visit by regulatory or assistance personnel determine that a smaller width buffer area would not significantly impact the biological, physical, or chemical integrity of the water resource. Vegetation stabilizes gravel and soil, holding bars and banks in place.

3. A buffer zone should be maintained in an undisturbed condition starting from the high bank of the stream inward 25 feet and for the length of the gravel removal site. Disturbed areas in this designated zone should be limited to maintained access road(s) for ingress and egress only. No clearing within this riparian area is authorized if a permit has been issued for this site by a state regulatory agency.

4. Do not remove gravel from below the elevation of the water line and leave a 20-foot buffer between the water line and removal area. If the stream is dry, sand and gravel removal should not occur deeper than the lowest undisturbed elevation of the stream bottom adjacent to the site.

5. Do not straighten, channelize or otherwise alter stream channels. Do not push material against banks as an erosion control method. Gravel is not an effective material for use in streambank stabilization. Please contact the agencies listed in Section III for assistance.

6. Any aggregate, fines, or oversized material removed from the site, should be placed in an upland, non-wetland site that has been approved by the landowner. No material, including oversized material that results from excavation activity may be stockpiled or otherwise placed into flowing water or placed against streambanks as bank stabilization.

7. All sand and gravel washing, crushing and sorting should be conducted above the high bank, in a non-wetland area and away from areas that flood to ensure any wash water that is warm, stagnant, or contains silty material cannot enter the stream or any wetland. All fines resulting from the sorting operation should be captured in a transport truck or other suitable container and removed from the sorting location to a suitable disposal site the same day that the sorting occurs. All sorted aggregate should be removed from the gravel bar at the end of each working day, with the exception of oversized material that will be spread out in the removal area following project completion.

8. Gravel removal should not take place between March 15 and June 15 to avoid harming spawning fish and their habitat.

9. Cross streams with vehicles and equipment at existing crossings only as permitted under RSMO 1991 Section 304.013 (the ATV law). Always cross at riffles, perpendicular to the stream. Vehicles by law must be kept out of streams except as above.

10. State law prohibits the dumping of fuel, oil and other wastes into streams. Such materials should be stored where they can not enter the stream channel and disposed of at authorized locations.

11. Sand and gravel operations may require a permit for storm water runoff, or gravel washing. Discharge from settling basins must meet Missouri Water Quality Standards and the permit limits. Contact the appropriate Department of Natural Resources' Regional Office listed in attachment #2 for more information.

12. Within 30 days of removal of excavation equipment from the site, streambank areas disturbed by the gravel removal operation should be revegetated or otherwise protected from erosion. For long-term operations (longer than 30 days) or for sites that will be periodically revisited as gravel is deposited, access points should be appropriately constructed and maintained such that stream banks and access roads are protected from erosion.

13. A contractor or outside party should have a copy of these guidelines. Discuss the requirements with them to ensure they understand how to remove sand and gravel.

14. Instream sand and gravel operations are prohibited from those waters listed as “Outstanding State Resource Waters” or “Outstanding National Resource Waters” (10 CSR 20-7.031). Please refer to attachment # 6.

15. Operators should consult with the Missouri Department of Conservation and the U.S. Fish and Wildlife Service regarding the presence of state and federal threatened and endangered species in the stream to avoid jeopardizing their continued existence by destroying or adversely modifying the habitat of such species.

If assistance is needed to help locate areas where sand and gravel may be removed with minimal impact to water quality and aquatic life of the stream, please contact the agencies listed in section three (3) of this manual.

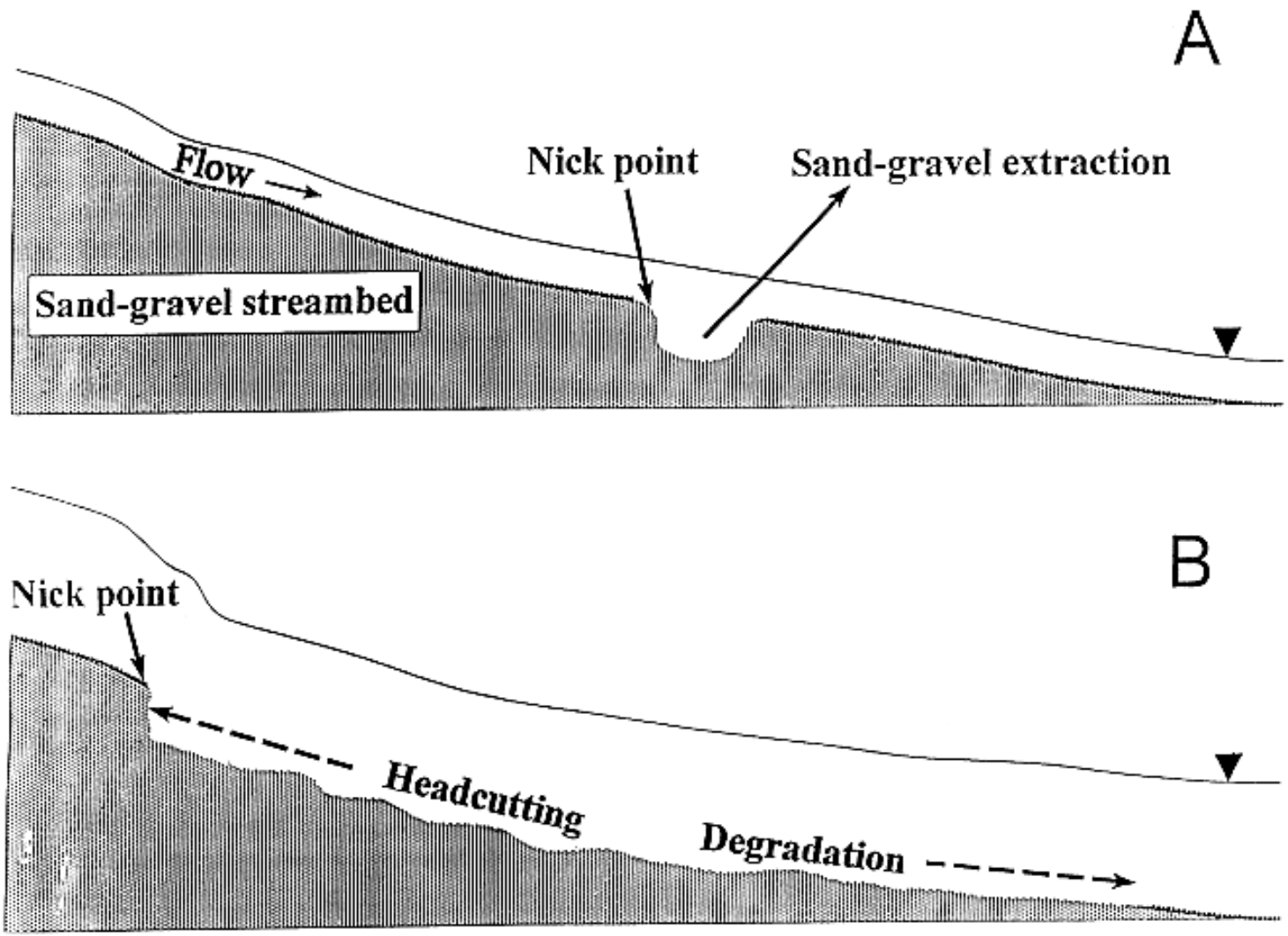

Figure 1. Diagram of a sand-gravel streambed showing (A) the nick point that develops when pit excavation is used to mine sand and gravel from the channel during low flows, and (B) the upstream headcutting and downstream bed degradation that develop during high flows. Inverted triangle denotes the water surface.

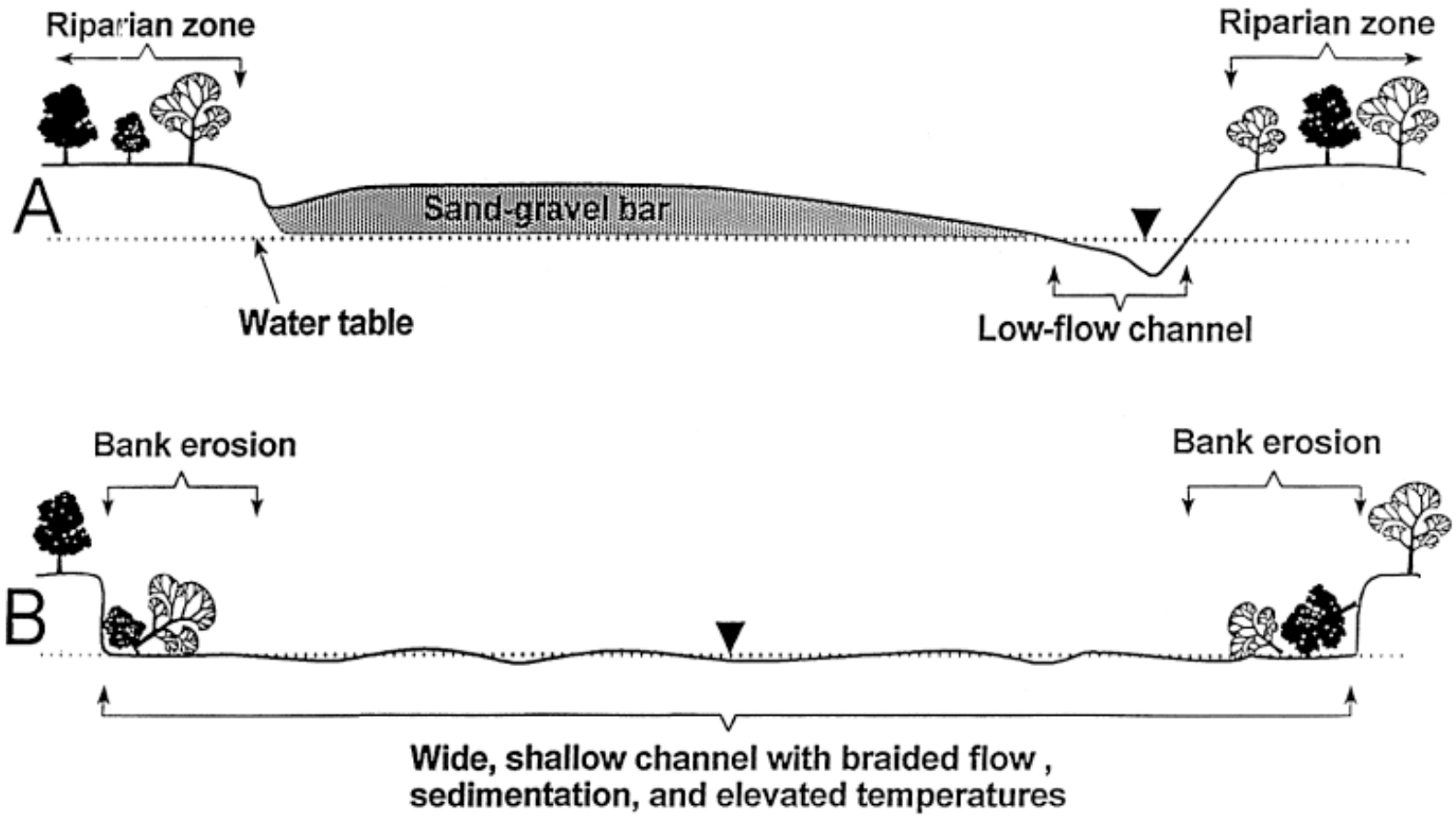

Figure 2. Diagram of channel cross sections showing (A) a typical sand-gravel bar in relation to the low-flow channel, riparian zone, and water table, and (B) the wide, shallow channel that results from unrestricted mining and that is characterized by bank erosion, braided flow, sedimentation, and elevated water temperatures. Inverted triangle denotes the water surface.

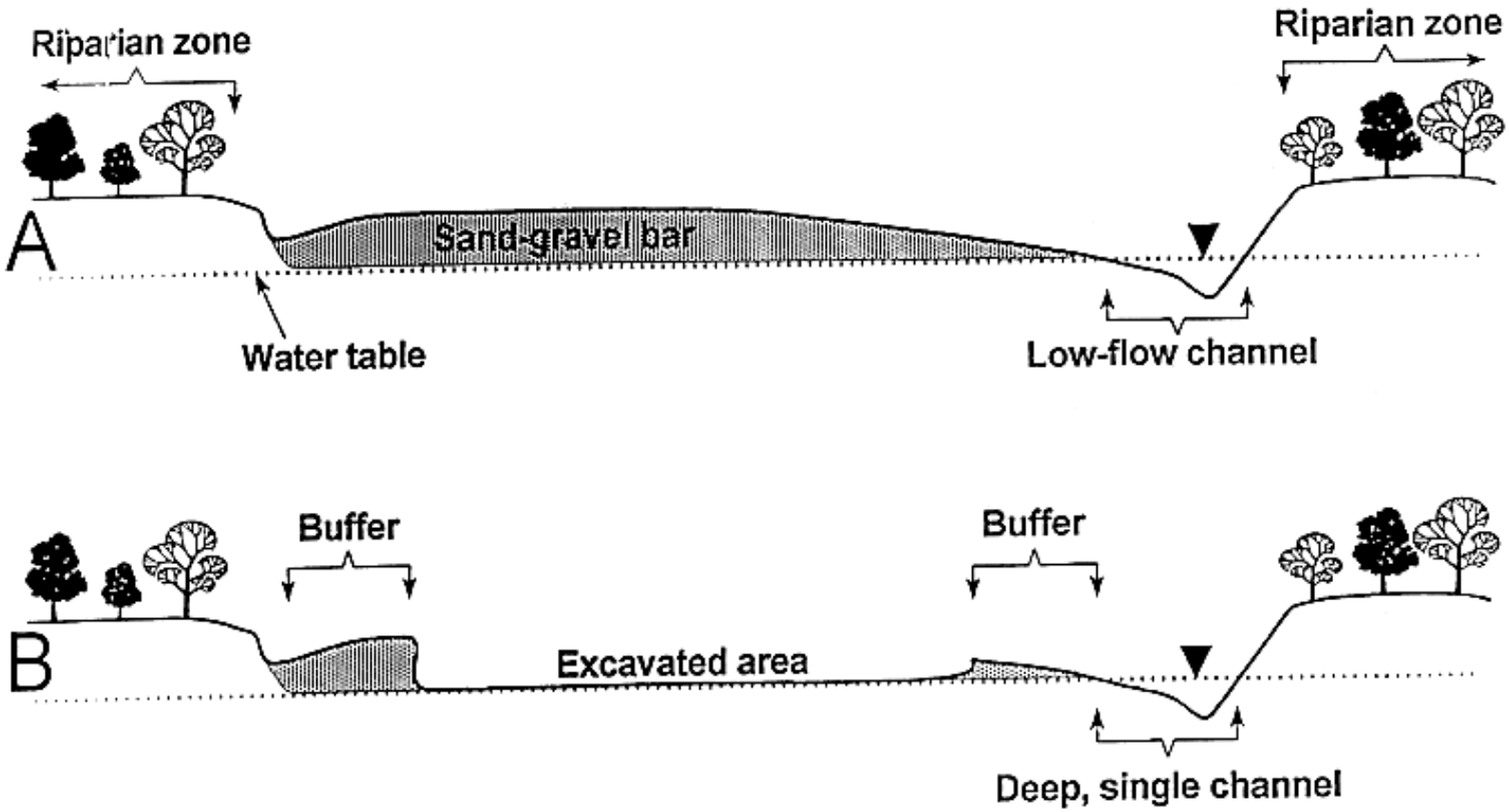

Figure 3. Diagram of channel cross sections showing (A) a typical sand-gravel bar in relation to the low-flow channel, riparian zone, and water table, and (B) the protected deep, single channel and channel banks when mining is restricted within a buffer of designated width and above the water table. Inverted triangle denotes the water surface.

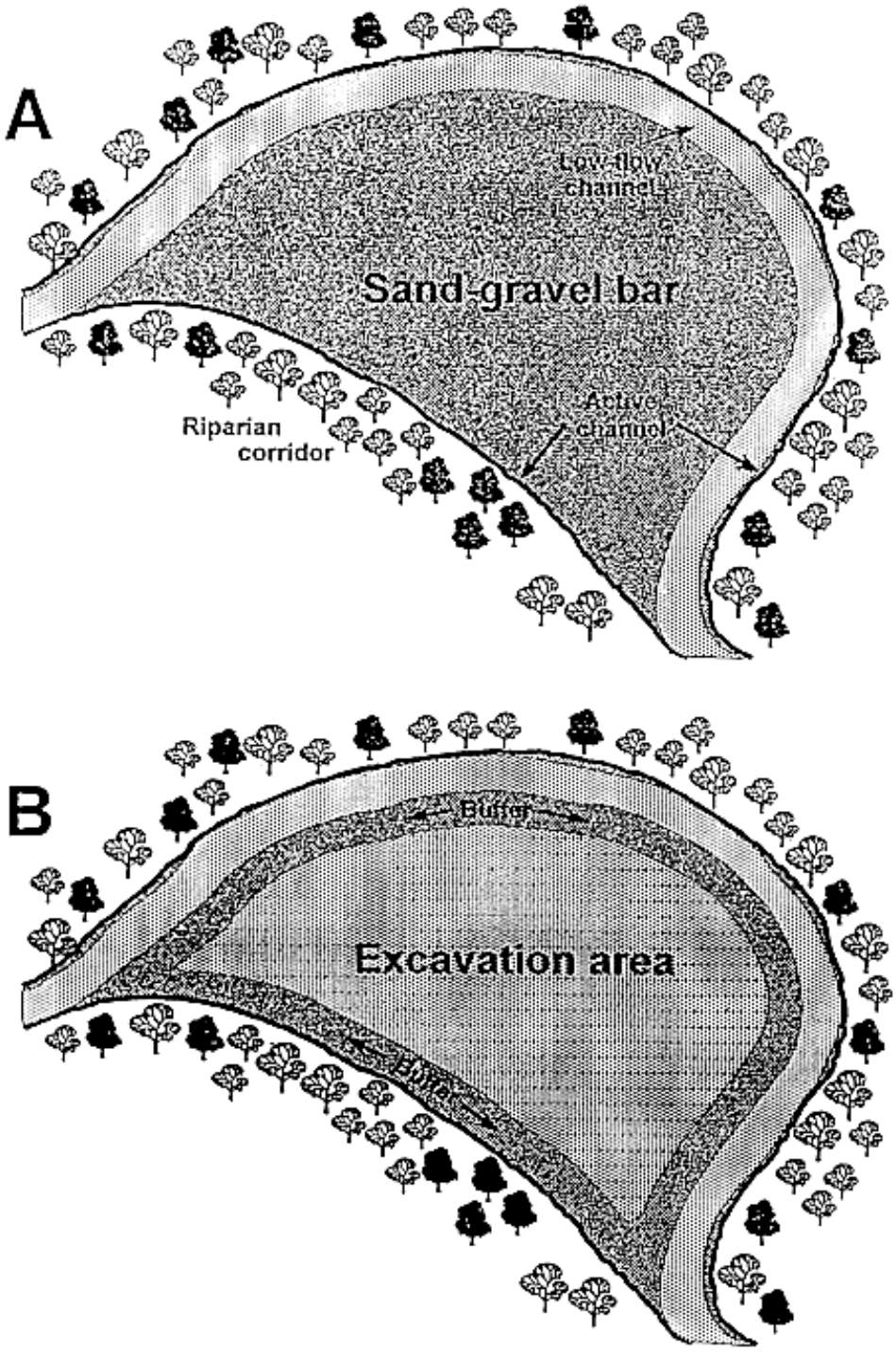

Figure 4 Diagram of a typical sand-gravel bar showing (A) the relative positions of the bar, the riparian corridor, the active (or bankfull) channel, and the low-flow channel, and (B) the area of excavation defined by a no-disturbance buffer of designated width

SECTION II

PREVENTING POLLUTION

AT

SAND AND GRAVEL OPERATIONS

Preventing Pollution at Sand & Gravel Operations - Guide Sheet #1

Pollution Prevention

Sand & Gravel operations deal with many things that can affect the environment. Materials such as dust, contaminated stream water and used oil can harm the environment and people if they are not properly managed. State and federal environmental regulations explain what legally can and cannot be done with these materials. The regulations describe how pollution should be controlled, stored, treated or disposed. A better solution is to prevent the waste or pollution.

What Is Pollution Prevention?
Pollution prevention is simply not making the waste or pollutant in the first place. It means doing what we can to reduce the amount and toxicity of the pollution we generate. Preventing pollution may be something as simple as using a catch-basin to prevent spills, or something as complex as redesigning your operation to increase efficiency and reduce waste. Simple things like choosing non-hazardous solvents can protect the environment and reduce the number of environmental regulations you face. Pollution prevention means thinking about the environmental impact of your actions, and trying to limit that impact.

Why Prevent Pollution?
When we generate waste or pollution, we must safely and legally manage that waste or pollution. Whether it is household trash or waste from a business, managing wastes costs money. And usually the things we discard are materials we paid for when we got them. A good example is paper towels. We buy them, use them once, then pay again to have them disposed. If we reduce the amount of waste we generate, we save money. It's as simple as that. Reducing costs is a major reason to prevent pollution. Here are a few others:

- ✔ Improved work environment and worker safety.
- ✔ Reduced liability.
- ✔ Increased efficiency.
- ✔ Fewer regulatory requirements.
- ✔ Better environmental protection.
- ✔ Enhanced marketing and public relations opportunities.

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What Can Be Done At Sand & Gravel Operations?

There are many ways to prevent pollution in your operation. In addition to the mining activities, maintenance and repair of vehicles and machinery can create wastes as can office operations. Each of the guide sheets has suggestions on ways to prevent pollution, but here are a few general tips:

- √ Keep work areas clean and well organized to help prevent accidents.
- √ Use drip pans and splash guards where spills frequently occur.
- √ Fix leaks immediately.
- √ Purchase the largest practical container (containers usually end up as waste), but don't purchase more than you need.
- √ Purchase the least toxic or hazardous product available. Check the material safety data sheets for products you purchase. If the product is toxic or hazardous, ask your supplier for alternatives.
- √ Use the oldest items first (first-in, first-out).
- √ If you do have excess or unneeded materials, see if your supplier can take them back
- √ Include the cost of disposal when you make purchasing decisions. What looks like the cheapest option may cost more because of disposal or other management costs.
- √ Store materials in a way that keeps them from being damaged.
- √ Inspect storage areas regularly for leaks.
- √ Make sure all items are clearly labeled. Store products in original containers.
- √ Store wastes separately and be sure they are properly labeled to make it easier to reuse or recycle them.
- √ Store items that could leak in a place where leaks will be contained and easily spotted.
- √ Make a list of your wastes. Then try to find a way to eliminate each of them. For example, if you throw away paper towels, consider using washable shop rags.

For more information call 1-800-361-4827 or write to
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Preventing Pollution at Sand & Gravel Operations - Guide Sheet #2

404 Permits and Wetlands

Under Section 404(a) of the Clean Water Act, you must get a permit from the U.S. Army Corps of Engineers (Corps) before putting dredged or fill materials into any "waters of the United States" (U.S.), or wetlands. This includes waters used (or usable) as habitat by certain birds or endangered species or used to irrigate crops sold in interstate commerce.

The following are not generally considered "waters of the U.S.":

- ✔ Non-tidal drainage and irrigation ditches
- ✔ Artificially irrigated areas
- ✔ Some small agricultural ponds
- ✔ Artificial reflecting or swimming pools
- ✔ Water-filled depressions **except** that water-filled depressions such as those formed from quarrying can be "waters of the U.S." if the construction or excavation operation is abandoned or completed and the body of water meets the definition of "water of the U.S." or the site has become a wetland.

The Corps and the Environmental Protection Agency (EPA) can designate a particular waterbody as a "water of the U.S." on a case by case basis.

The Corps and the EPA define wetlands as "Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

The Corps determines whether an area is a wetland and if an activity requires a permit. The determination of a wetland is based on vegetation, soil and hydrology. River and stream jurisdiction is determined by the presence of a defined bed and bank presence or the normal high water mark. Before issuing a 404 permit, the Corps will work with the Missouri Department of Natural Resources to get a water quality certification called a 401. This certification is required under Section 401 of the Clean Water Act and state law, and it's purpose is to review the federal permit for water quality and aquatic life impacts.

There are five U.S. Army Corps of Engineers Districts in Missouri. Use the map on the back of this sheet to find out which office to contact for more assistance.

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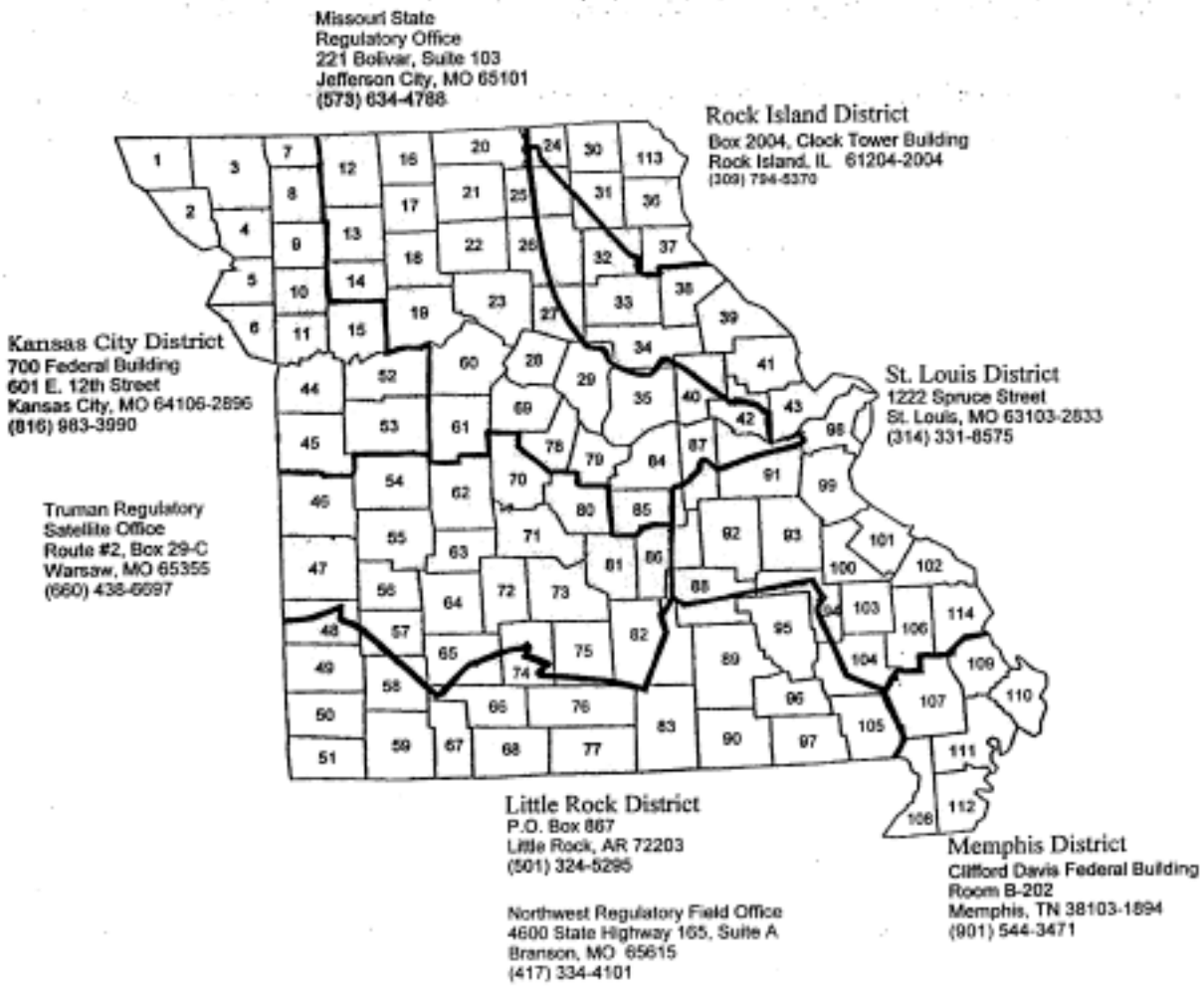
REMEMBER

➜ If you plan to excavate or fill in waters of the U.S., including wetlands, you must contact the U.S. Army Corps of Engineers and get any necessary permits BEFORE you begin.

U.S. Army Corps of Engineers District Boundaries (approximate)



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June 2001

Antifreeze

Antifreeze is usually made of ethylene glycol, corrosion inhibitors and foam controllers. Ethylene glycol is toxic if ingested. It can be particularly hazardous because animals and children may be attracted to its sweet flavor. If they drink the ethylene glycol it could cause coma or death. Some antifreeze is made of propylene glycol. This material is less hazardous to humans and animals than ethylene glycol.

The used antifreeze from a vehicle can hold contaminants that it has picked up from the vehicle engine. For example, used antifreeze may contain lead because the antifreeze has dissolved some of the lead solder in the radiator. Waste antifreeze is not a listed hazardous waste under the federal hazardous waste regulations, but it **may** be a hazardous waste depending on the contaminants it has picked up. The test used to find out if used antifreeze is a hazardous waste is called the Toxicity Characteristic Leaching Procedure (TCLP). See the guide sheet on hazardous waste for more information.

Recent studies have shown that antifreeze from cars and trucks manufactured after 1995 is not hazardous waste. This is primarily because less lead is used in radiator construction. Used antifreeze is more likely to be hazardous if it was used in heavy equipment such as bulldozers.

This means that the antifreeze from late-model cars and trucks at your operation that has not been mixed with other antifreeze or with other hazardous wastes does not need to be tested. You can assume that it is not hazardous and need not test it to prove that. However, the used antifreeze from heavy equipment or industrial sources will need to be tested to see if it is hazardous waste unless you have some other way of knowing that it is or is not hazardous. If you wish, you can assume the antifreeze from your heavy equipment is hazardous without testing it and dispose of it as hazardous waste.

There are several ways to safely and legally manage your used antifreeze:

✔ Recycle the antifreeze at your facility (on-site recycling).
✔ Send the antifreeze to someone else to either recycle or dispose of it (off-site recycling or disposal).
✔ Discharge to public wastewater treatment plant **<u>if</u>** the plant has approved the discharge.

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Recycling. The Missouri Department of Natural Resources encourages antifreeze recycling. You can purchase or lease several types of antifreeze recycling equipment.

Recycling hazardous wastes on-site requires a type of approval from the department called resource recovery certification. If you recycle antifreeze only from late-model cars and trucks, you do **NOT** need a resource recovery certification to recycle antifreeze on-site. If you want to recycle antifreeze from heavy equipment, you must get a resource recovery certification. Call the department at 1-800-361-4827 for more information.

Your recycling unit will create waste such as distillation residues and used filters. You must determine if these wastes are hazardous before disposal. See guide sheet #5 *Hazardous Wastes*, for more information. If the residue is nonhazardous, it can be sent to the landfill with your regular trash. However, liquids cannot go to the landfill.

There may be businesses that will bring equipment to your facility and recycle your antifreeze on-site. Again, if the antifreeze is from late model cars and trucks, these companies do not need resource recovery certification. If it is from heavy equipment, these companies will need resource recovery certification to recycle your antifreeze.

Off-site Recycling or Disposal. There are companies that pick up used antifreeze for off-site recycling or disposal. If your used antifreeze is a hazardous waste, the transporter must have a Missouri license to transport hazardous waste and the waste must have a hazardous waste manifest with it. Make sure the facility you send it to has a resource recovery certification or a hazardous waste treatment, storage and disposal permit.

Discharge to wastewater treatment plant (pouring it down the drain). If the drains at your facility go to a wastewater treatment plant (not a septic system), you MAY be able to pour antifreeze down the drain **IF** you have permission from the plant. Pouring something down the drain is called a discharge. Some plants will not allow discharges of used antifreeze. Large quantities can harm the treatment plant. Also, the wastewater treatment plant may not be able to remove all the contaminants from the used antifreeze. The contaminants then enter lakes, streams and rivers.

✔ **DO NOT** discharge antifreeze to a wastewater plant without permission.
✔ **DO NOT** discharge any hazardous waste, including antifreeze, to a septic system.
✔ **DO NOT** dispose of antifreeze in or on the ground, down storm drains or into streams or lakes.

POLLUTION PREVENTION

√ Make sure hoses, gaskets and seals are in good condition.
√ Replace antifreeze only when necessary.
√ When good antifreeze must be removed for repairs, save it and reuse it in the system.

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Preventing Pollution at Sand & Gravel Operations - Guide Sheet #4

Endangered Species

Endangered species are plants or animals for which the prospect for survival of the species is in immediate jeopardy. There are laws to protect these species and, in some cases, their habitat. This means that some activities may not be allowed in areas where endangered species live. This may affect you if you are planning to expand operations or select a new site on a different stream.

The Missouri Department of Conservation (MDC) is the agency responsible for collecting and managing information on the location and status of endangered species in the state. There are currently 306 species of plants and animals that are listed as State Endangered. The federal list includes 20 species found in Missouri.

The restrictions affecting you depend on whether the species is a plant or animal, whether the land is private property and whether you receive any federal funds. To contact MDC=s Policy Coordination Section for general information, call (573) 751-4115.

The booklet, *Endangered Species in Missouri*, gives a general discussion of the topic of rare and endangered species. The annually updated *Rare and Endangered Species Checklist of Missouri* is a reference listing all of the current plants and animals of concern and giving both the federal and Missouri status.

There may be times when you need to determine if there are endangered species on a property, such as when you are developing permit applications for a new or expanded site. To get an Environmental Review of a piece of property, send a request to MDC by mail. If there are no endangered species associated with the property, MDC will issue a letter stating so. Even if you are not required to have an Environmental Review for endangered species, you may wish to do so, particularly if you are planning to purchase property.

When contacting MDC, it is important to clearly identify the location of the property. The information should include as many of the following as possible: county, topographic quadrangle map designation (if known), legal description (section, township, range), acreage, permanent landmarks such as rivers and roads, and a copy of a map of suitable scale with the location of the

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property drawn in and labeled. The request should be sent to

Policy Coordination Section
Attn: Policy Coordinator
Missouri Department of Conservation
P.O. Box 180
Jefferson City, MO 65102-0180

Note: The state regulation dealing with endangered species is located in the *Missouri Code of Regulations* Title 3, Division 10, Section 4.111 (3 CSR 10-4.111).

REMEMBER

➜ It is illegal to harm federally-listed endangered species or their habitat.
➜ It is illegal to harm species that are listed in Section 4.111 of Missouri's Wildlife Code.
➜ Contact the Missouri Department of Conservation for information on endangered species in Missouri.

POLLUTION PREVENTION

Preventing pollution instead of treating or disposing of it can help to protect habitats. Here are some suggestions:

√ Learn more about rare and endangered species in your area of the state. Find out how you can improve habitat for them.

√ Properly design, construct and maintain detention basins to capture sediment. Sediment is a major pollutant of aquatic environments.

√ Revegetate disturbed areas as soon as possible and in accordance with your permit. Use native plants from a reputable source that provide food and cover for wildlife.

√ Avoid spilling oil, grease and gasoline during vehicle and equipment maintenance activities.

√ Maintain appropriate spill containment equipment and train employees on proper usage.

Preventing Pollution at Sand & Gravel Operations - Guide Sheet #5

Hazardous Wastes

Some activities at your operation may result in the generation of hazardous waste. It is very important that you determine if your wastes are hazardous and that you carefully follow the law when managing the wastes.

What is a Hazardous Waste?
A waste is a material you no longer use and will discard. It can be a solid, liquid or gas. A waste is hazardous if it has certain properties that could pose a danger to human health and the environment. Solvents and degreasers are examples of wastes that could be hazardous.

It is **your** responsibility to determine if your waste is hazardous. A waste is hazardous if
✔ It is listed as a hazardous waste in the federal regulations;
✔ It exhibits a hazardous characteristic;
✔ It is a hazardous waste by Missouri law; or
✔ It is a mixture of a listed hazardous waste and any other waste.

Listed Hazardous Waste - The federal government publishes lists of hazardous wastes. There are four different lists: The F list, the K list, the P list and the U list. Wastes that are on the P list are called "acutely hazardous" and are regulated more strictly than the others.

Characteristic Hazardous Waste - Some wastes that are not on the lists may still be regulated hazardous wastes because they have characteristics that make them hazardous. The four characteristics are

Ignitable - A waste with a flashpoint of less than 140 F, or solids that catch fire easily and burn so rapidly they create a hazard. Some solvents are ignitable.

Corrosive - A waste with a pH less than or equal to 2.0 or greater than or equal to 12.5. An example is battery acid.

Reactive - Wastes that are normally unstable, react violently with water, can explode or release poisonous gases.

Toxic - Wastes with high concentrations of volatile organic chemicals, heavy metals or pesticides when tested by the Toxicity Characteristic Leaching Procedure (TCLP).

Missouri-specific Hazardous Waste - An individual state can regulate wastes as hazardous even if they are not on the federal list. For example, in Missouri certain dioxin wastes are regulated at smaller quantities than in the federal rules.

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Mixed Waste - If you mix any waste with a waste that is on the F-, P-, K- o r U- lists, all of it is hazardous, even if there is a very small amount of listed waste.

Is Your Waste Hazardous? The Material Safety Data Sheet (MSDS) will often tell you whether your chemicals are regulated as hazardous waste. Your supplier should also be able to give you the information.

You need to find out if the waste is on one of the lists of hazardous wastes or if it is a hazardous waste in Missouri. If it is not, you need to find out if it exhibits one or more of the hazardous characteristics. If you don't know if your waste is hazardous, you will need to have it tested in a laboratory. Contact the Missouri Department of Natural Resources' Technical Assistance Program at 1-800-361-4827 for help with this.

Managing Hazardous Wastes

There are very specific requirements for managing the hazardous waste from your business. The requirements you must meet depend on what and how much waste you generate. You need to know how much acutely hazardous waste (P-listed) and non-acute hazardous waste you generate each month. You also need to know how much of each of these types of waste you accumulate at any one time.

Use the following information to figure out what type of generator you are. Then contact the department's Technical Assistance Program or another environmental professional to learn the specific requirements for managing your waste.

What Type of Generator Are You?

There are three types of generators -- Large Quantity Generator (LQG), Small Quantity Generator (SQG) and Conditionally Exempt Generator (CEG). Here are some general guidelines to help you decide what type of generator you are:

If you generate in one month or accumulate at any one time . . .

✔ more than 1 kg (2.2 pounds) of acutely hazardous waste you are a LQG.

✔ 1,000 kg (2,200 pounds) or more of non-acute hazardous waste you are a LQG.

✔ more than 100 kg (about 220 pounds), but less than 1,000 kg (2,200 pounds) of non-acute hazardous waste AND less than 1 kg of acutely hazardous waste you are a SQG.

✔ no more than 100 kg (220 pounds) of non-acute hazardous waste AND less than 1 kg of acutely hazardous waste you are a CEG.

✔ In Missouri, anyone generating 1 gram or more of dioxin waste (2,3,7,8-tetrachlorodibenzo-p-dioxin) is a LQG.

The federal requirements for hazardous waste can be found in the Code of Federal Regulations, Title 40, Part 260 through Part 280 (40 CFR 260-280). The Missouri Hazardous Waste Law is in the Revised Statutes of Missouri (RSMo), Sections 260.350-260.552. The hazardous waste rules are in the Code of State Regulations, Title 10, Division 25 (10 CSR 25).

For more information call 1-800-361-4827 or write to
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P.O. Box 176
Jefferson City, MO 65102

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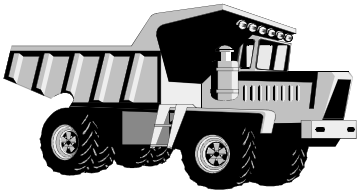
Preventing Pollution at Sand & Gravel Operations - Guide Sheet #6

Lead-Acid Batteries



In this document the term "battery" means lead-acid battery.

Lead-acid batteries from motor vehicles contain materials that can pose a risk to people and the environment. These batteries contain sulfuric acid, lead and other materials that can be hazardous. Missouri's Solid and Hazardous Waste Management Laws have requirements for managing waste batteries.

It is against the law for anyone to dispose of lead-acid batteries in Missouri. You must send the batteries to a recycling facility, a resource recovery facility or a permitted lead smelter. Never put batteries in your trash or dumpster. Lead-acid batteries cannot go to a landfill and they cannot be burned.

If you store batteries, it must be in a way that protects human health and the environment. It is important to store batteries so that they do not crack or leak. Store the batteries indoors or under cover to keep them dry and prevent damage to the casings. Never store batteries near combustibles such as gasoline because of the risk of sparks caused by electrical discharge of the batteries.

Store batteries so that any leaking liquid will be caught. The liquid inside batteries is sulfuric acid and it may contain dissolved lead and cadmium. Be sure you have procedures for handling spills and/or leaking batteries.

Anyone handling batteries or spilled material should wear protective clothing and eyewear. If acid leaks out of the batteries, collect it and handle it as a hazardous waste. See the guide sheet on Hazardous Waste for more information.

If you store large quantities of batteries you may have more regulations to follow. If you store over 200 batteries, you may be subject to EPCRA requirements. See the guide sheet #7, *EPCRA and Tier II Reporting*, for more information.

Note: The part of the law dealing with lead-acid batteries is ∋260.260-260.266, *Revised Statutes of Missouri*.

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REMEMBER

➜ Don't put batteries in the trash. Batteries must go to a recycling facility, a resource recovery facility or a permitted lead smelter. They cannot go to a landfill.
➜ Battery acid may be a hazardous waste.

POLLUTION PREVENTION

Preventing pollution instead of treating or disposing of it can save money, protect the environment and reduce risk to people. Here are some suggestions:

√ Store batteries where they will not be damaged or frozen.

√ Store batteries so that leaks will be caught and contained.

√ Anchor batteries when transporting.

√ Use long-life batteries.

√ Inspect stored batteries regularly so you can find cracks or leaks before they become a problem.

For more information call 1-800-361-4827 or write to
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Preventing Pollution at Sand & Gravel Operations - Guide Sheet #7

Storage Tanks

Some sand & gravel operations have storage tanks containing oil or fuel. These tanks have the potential for leaking and spilling oil or fuel, causing harm to the environment. Storage tanks, depending on size, usage or type, are regulated by several agencies.

Aboveground Storage Tanks (ASTs)
Federal law requires you to have a Spill Prevention Control and Countermeasure (SPCC) Plan if you have an oil or used oil storage tank located where it could contaminate water with spilled oil, for example on or near a stream, lake or river. You also need a SPCC plan if you have

✔ any single aboveground storage container with a capacity over 660 gallons,
✔ aboveground aggregate storage capacity over 1320 gallons, or
✔ total underground storage capacity over 42,000 gallons.

The basic requirements of an SPCC plan include what you do to prevent spills, how you plan to contain any spills and how you plan to remove and dispose of the oil or fuel if you have a spill. Also, the storage tanks must be in a containment area.

Aboveground petroleum product storage tanks at a service station or a bulk terminal are regulated by the Missouri Department of Agriculture. If your business includes these operations contact them at

Missouri Department of Agriculture
Division of Weights and Measures
P.O. Box 630
Jefferson City, MO 65102
(573) 751-4278

Underground Storage Tanks (USTs)
If you have an underground storage tank (UST) larger than 110 gallons, you must register that tank with the Missouri Department of Natural Resources whether or not the tank is in use, unless the tank was taken out of service before January 1, 1974. There are requirements in Missouri for the way new tanks are to be constructed and installed. Existing tanks were required to meet these requirements or be properly closed by December 22, 1998. If you are planning to install a new UST, you must notify the department at least 30 days before you use the tank. All USTs must have an approved method of release detection.

You must notify the department by calling (573) 634-2436 as soon as possible within 24 hours of a suspected release from your UST. Spills and overfills must be immediately contained and cleaned up.

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If you plan to take your UST out of service temporarily or permanently, or if you want to use it for something besides petroleum products, contact the department for information on what you need to do.

Owners and operators of petroleum USTs must demonstrate financial responsibility for releases of products from the tanks. Several options are available for demonstrating financial responsibility. Missouri has a Petroleum Storage Tank Insurance Fund, which provides for cleanup of contamination from both AST and UST releases. Your tanks may be eligible for benefits from this fund.

REMEMBER

- ➜ If you have an underground storage tank larger than 110 gallons you must register it with the department even if it isn't being used.
- ➜ If you store large quantities of oil or waste oil, you need a Spill Prevention Control and Countermeasure (SPCC) Plan.
- ➜ Spills must be reported to the department as soon as possible within 24 hours.

POLLUTION PREVENTION

Preventing pollution instead of treating or disposing of it can save money, protect the environment and reduce risk to people. Here are some suggestions:

√ Prevent overfilling and spilling.

√ Label tank contents to prevent mixing.

√ Properly maintain tanks to prevent corrosion.

√ Place tanks where leaks can be easily contained without entering the environment.

√ Inspect tanks daily for leaks and spills.

√ Maintain appropriate spill containment equipment and train employees on proper usage.

√ Clean up spills as soon as possible.

√ Close out unused or out-of-service USTs in accordance with the department's regulations.

For more information call 1-800-361-4827 or write to
Missouri Department of Natural Resources
Technical Assistance Program
P.O. Box 176
Jefferson City, MO 65102-0176

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Preventing Pollution at Sand & Gravel Operations - Guide Sheet #8

Used Oil Disposal and Recycling

Improper disposal of used oil can harm the environment and result in costly cleanup. In Missouri, there are certain things you must do and certain things you cannot do when managing used oil from your business.

You cannot dispose of used oil at a landfill or with your regular trash. You cannot dispose of your used oil into the environment or create a public nuisance. You cannot use used oil for dust suppression or killing weeds on gravel roads, parking lots or elsewhere. You also cannot use it to start brush or trash fires.

Used oil is regulated under the federal and state hazardous waste laws and regulations. If you recycle your used oil, it is regulated under special used oil regulations. Recycled used oil includes oil that is re-refined, reclaimed, reprocessed or burned for energy recovery. If you do not recycle your used oil, it is regulated as a hazardous waste. The waste code for used oil in Missouri is DO98. See the guide sheet on Hazardous Waste.

Off-Site Shipments of Used Oil. Used oil must be hauled only by transporters who have EPA identification numbers and Missouri transporter licenses. Contact the Missouri Department of Natural Resources for a list of transporters with Missouri licenses.

You can transport your own used oil if
✔ you transport 55 gallons or less.
✔ it is your own used oil or used oil from do-it-yourselfers or exempt farmers.
✔ you take the oil to a used oil collection center or used oil aggregation point.
✔ you use your own vehicle or an employee's vehicle.

Mixing other wastes with used oil. Be very careful what you mix with used oil. The regulations do allow mixing of certain ignitable hazardous waste with used oil if the mixture you end up with is not ignitable. However, if the waste is hazardous for some reason besides being ignitable (for example, if it's also a listed hazardous waste), mixing it with your used oil will make your used oil a hazardous waste. For example, mixing your F-listed spent solvents with used oil will cause all of the oil mixture to be hazardous waste. See guide sheet #5, *Hazardous Wastes*, for more information.

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On-Site Space Heaters. You may burn your own used oil, oil from do-it-yourselfers and oil from farmers who generate fewer than 25 gallons per month in specially-designed used oil space heaters. Used oil space heaters must have a capacity of 500,000 BTU per hour or less and be vented outside.

You do not need to notify the department if you are burning used oil in this type of space heater, but you must notify the department if you are collecting used oil from do-it-yourselfers or farmers. Contact the department for more information on collecting used oil from others.

If you are a small quantity or large quantity generator of hazardous waste you cannot burn any mixture of used oil with hazardous waste in a used oil space heater. If you are a conditionally exempt generator of hazardous waste that is hazardous only because it is ignitable, you may mix it with your used oil for burning. However, this can damage the space heater and release hazardous emissions into the environment. Before adding anything to your used oil, check with your used oil transporter or used oil space heater manufacturer to make sure that practice is acceptable.

REMEMBER

- ➜ You cannot send used oil to the landfill or pour it out onto the ground.
- ➜ If you are not recycling your used oil, it is a hazardous waste.
- ➜ If someone else is hauling your used oil, they must have an EPA identification number and be registered with the department.
- ➜ You may burn your own used oil in a used oil burner no larger than 500,000 BTU/hour that is properly vented.

POLLUTION PREVENTION OPTIONS

Preventing pollution instead of treating or disposing of it can save money, protect the environment and reduce risk to people. Here are some suggestions:

√ Keep used oil separate from other wastes.

√ If you remove oil-laden parts, place them on a drip pan rather than the floor or ground.

√ Do not use the oil drip pan to collect antifreeze or solvent.

For more information call 1-800-361-4827 or write to
Missouri Department of Natural Resources
Technical Assistance Program
P.O. Box 176
Jefferson City, MO 65102

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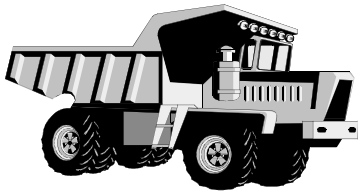
Preventing Pollution at Sand & Gravel Operations - Guide Sheet #9

Used Oil Storage



Improper storage of used oil can increase the risk of spills and leaks that could harm the environment and prove costly to clean up. In Missouri, there are some legal requirements for storing used oil from your business.

If you store used oil, you must:

✔ Label or mark the storage container(s) with the words "Used Oil."
✔ Keep containers in good condition.
✔ Store used oil collected from do-it-yourselfers no longer than 12 months.
✔ Keep containers closed if they are exposed to rain or snow (except when removing or adding used oil).
✔ Inspect storage areas regularly for leaks or spills.
✔ Fix leaking containers immediately or move the oil to another container.

Although you aren't required to, you may wish to put your used oil containers in a "secondary containment" structure to prevent spills and contamination. Secondary containment is the name used to describe a structure or container that holds the storage tank and can hold the liquid if the storage tank leaks. The secondary containment should have a volume at least 10 percent greater than the volume of the largest container inside of it.

If you are storing a large amount of oil (one tank over 660 gallons or a total of over 1320 gallons) you are required to have spill prevention measures. See guide sheet #12, *Petroleum Storage Tanks*, for more information.

Your community or county may have specific requirements for storing oil. Check with local authorities, particularly your fire department.

The Missouri Department of Natural Resources recommends not storing used oil in underground tanks.

Storing containers on an impervious surface such as sealed or treated concrete helps contain spills and makes cleanup easier. Some shops store their used oil containers on pallets or slightly elevated in some way to make it easier to spot spills or leaks.

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Clean up any spills immediately. Petroleum spills, including oil, over 25 gallons from a storage tank must be reported to the department. Petroleum spills from other sources must be reported if they are over 50 gallons. However, a petroleum spill into a waterway such as a river, stream, lake or creek must be reported to the department no matter how small the spill.

(The legal requirements for used oil storage can be found in *10 CSR 25, Chapter 11 of the Missouri Code of State Regulation* and in the federal regulations, *40 CFR Part 279*.)

REMEMBER

➜ Label or mark storage containers with the words "Used Oil" and keep them in good condition.
➜ Inspect storage areas regularly. Fix leaks immediately or move the oil to another container.
➜ If containers are exposed to rain, keep them closed except when adding or removing used oil.
➜ Check with local authorities to learn if there are local requirements.
➜ Oil spills of 25 gallons or more must be reported to the department by calling (573) 634-2436.

POLLUTION PREVENTION OPTIONS

Preventing pollution instead of treating or disposing of it can save money, protect the environment and reduce risk to people. Here are some suggestions:

√ Keep used oil separate from other wastes.

√ Have separate storage containers for antifreeze, solvents or other fluids that could accidentally be mixed with used oil.

√Use large drum funnels or fill tubes when filling used oil drums. Store funnels on a drip pan to collect dripping oil.

√ Clean spills on a floor with a rag or mop that can be wrung-out and reused. A biodegradable soap and water solution may be used to clean up oil sheens.

For more information call 1-800-361-4827 or write to

Missouri Department of Natural Resources
Technical Assistance Program
P.O. Box 176
Jefferson City, MO 65102

June 2001

Preventing Pollution at Sand & Gravel Operations - Guide Sheet #10

Waste Tires

Tires that are too damaged or worn for use as vehicle tires are waste tires. Since 1990, the storage, hauling and disposal of waste tires have been regulated under Missouri's Solid Waste Management Law.

Storage. Waste tires must be stored in a way that does not cause pollution, health or nuisance problems. Since tires can collect water and create breeding grounds for mosquitoes, you should protect your storage area from rainwater or provide some other way to control mosquitoes. Tires may also pose a fire hazard, so they should always be stored away from ignition sources.

Store any tires intended for resale or retreading separately from waste tires. Tires intended for resale or retreading are not regulated as waste tires.

Anyone storing 25 to 499 tires is regulated as a waste tire collection center and must meet certain requirements. Anyone who stores 500 or more tires must have a permit from the Missouri Department of Natural Resources as a waste tire site. Contact the department for more information on these two activities.

Hauling. If you pay someone to haul away your waste tires, that person needs a permit from the department. However, you or other employees from your business do not need a permit to haul tires generated from your business. The tires may be hauled to a waste tire processor, site or end user or to a landfill (if they are cut, chipped or shredded).

A tire hauler's permit is good for one year and only applies to the business or person to whom it is issued. Check the expiration date and name on the permit to be sure it is valid. To get the list of permitted waste tire haulers or check the permit status of a hauler who picks up tires at your quarry, contact the department.

Recordkeeping. You should keep a record of how many tires are taken in and removed from your facility each month. Include the name of the hauler and the date the tires were removed. Recordkeeping forms are available from the department.

Beneficial use. Sometimes a person wants a few waste tires for a home project. Individuals can haul their own waste tires for their own use. If someone wants to use over 100 tires, they need to get the department's approval. Using tires for erosion control is not a good idea. In Missouri, you are not allowed to place tires

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in waters of the state. This includes streams, rivers, gullies and wet-weather creeks (among other areas).

Processing. Anyone who processes waste tires for a fee must have a processing permit from the department if more than 25 tires are on-site at any time. You do not need a permit to process tires generated from your own business. Processing includes shredding, cutting, chipping or otherwise altering the tires.

Disposal. Never burn tires in Missouri. Even in areas where home waste burning is allowed, burning tires is prohibited.

You cannot dispose of tires in a landfill unless the tire is cut up in three or more pieces or in half circumferentially (forming two circles). There are places to legally take your waste tires in Missouri. They usually charge a fee per tire and can accept whole tires. Contact the department for a list of sites.

The department presently allows tires from large earth-moving equipment to be buried on-site in limestone quarries provided it does not cause pollution, a health hazard or a public nuisance. However, this practice is not encouraged. You should try to find alternative ways to manage these tires. There are facilities in Missouri who can process these tires. Contact the department for a list.

Uses for waste tires. There are options for using waste tires rather than disposing of them. Waste tire chips can be used for many things such as mulch on playgrounds or as fuel in electrical power plants or cement kilns. Contact the department for information on reuse and recycling options.

The legal requirements for waste tires can be found in ➢260.270-278, Revised Statutes of Missouri (RSMo) and in 10 CSR 80, Chapter 8 of the Code of State Regulations.

REMEMBER

- ➜ Do not burn waste tires.
- ➜ Waste tires cannot go to the landfill unless they are cut into three or more pieces or in half circumferentially (in two circles).
- ➜ If you wish to store 25 or more waste tires, you must follow requirements for waste tire collection centers. Contact the department for more information.
- ➜ If you pay someone (other than an employee) to haul away your waste tires, that person needs a waste tire hauler permit from the department.

For more information call 1-800-361-4827 or write to

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Technical Assistance Program
P.O. Box 176
Jefferson City, MO 65102

June 2001

Preventing Pollution at Sand & Gravel Operations - Guide Sheet #11

Wastewater

Rainwater that falls in and around mining operations can become contaminated with sediments, oil, grease and other materials. Runoff from gravel piles may also be caustic. If not properly managed, this contaminated water can harm the environment, pollute creeks and lakes, and even contaminate drinking water.

To prevent environmental and human health problems, the federal Clean Water Act requires that you have a permit if you wish to discharge water that has contamination in it. This permit is called a National Pollutant Discharge Elimination System (NPDES) permit. The Missouri Department of Natural Resources issues these permits in Missouri where they are called Missouri State Operating Permits.

If you own or operate a sand & gravel operation, you may need to apply for and obtain a Missouri State Operating Permit for storm water discharge. The requirements of the discharge permit are intended to minimize or prevent water pollution. You will need to sample and test water discharges from your operation as your permit requires.

The storm water permitting requirements are being handled in two ways: general and site specific permits.

General Permit
General permits are written to cover a group of facilities with similar discharges or processes. Individual facility operators must apply for a permit to be issued for their facilities. A general discharge permit has been issued for rock quarries. The general permit authorizes discharges of stormwater, wash water and water from dewatering pumping from quarries. It does not authorize the use of soap or detergents in truck washing. If you want to discharge any wastewater not authorized in the general permit, you must apply for a site specific permit.

If you do other types of mining, mine sand and gravel, or produce concrete or asphalt, you will need to apply for other permits. The quarry general permit does not apply to these activities.

Site Specific Permit
A site specific permit takes into account the individual characteristics of the site and the storm water runoff. Even if you are eligible to apply for a general permit, you can apply for a site specific permit if you prefer. In some cases, the department may require a site specific permit to better protect water quality.

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Rock quarries are required to have a permit. A general permit is available that may cover your facility. To apply for that Missouri State Operating Permit you will need to complete an application Form E and submit a location map and a fee to the department. Permits are good for a period of five years. If an individual permit or other information is needed, the department will contact you.

REMEMBER

➜ If you wash your sand & gravel you must have a Missouri State Operating Permit for your stormwater discharge.
➜ Discharge only the types of wastewater your permit allows.

POLLUTION PREVENTION

Preventing pollution instead of treating or disposing of it can save money, protect the environment and reduce risk to people. Your permit may require certain pollution prevention practices or even a pollution prevention plan. Here are some suggestions:

√ Design, construct and maintain a detention basins to capture sediment.

√ Use interceptor dikes, swales or berms to direct storm water away from areas that are prone to erosion or to convey runoff to the detention basin.

√ Inspect and maintain the erosion prevention and sediment control structures to ensure their effectiveness.

√ Revegetate disturbed areas as soon as possible.

√ Prevent spills of oil, grease and gasoline in vehicle and equipment maintenance activities.

√ Maintain appropriate spill containment equipment and train employees how to use it.

√ Use mulches, geotextiles and other measures to prevent erosion.

For more information call 1-800-361-4827 or write to
Missouri Department of Natural Resources
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P.O. Box 176
Jefferson City, MO 65102

SECTION III

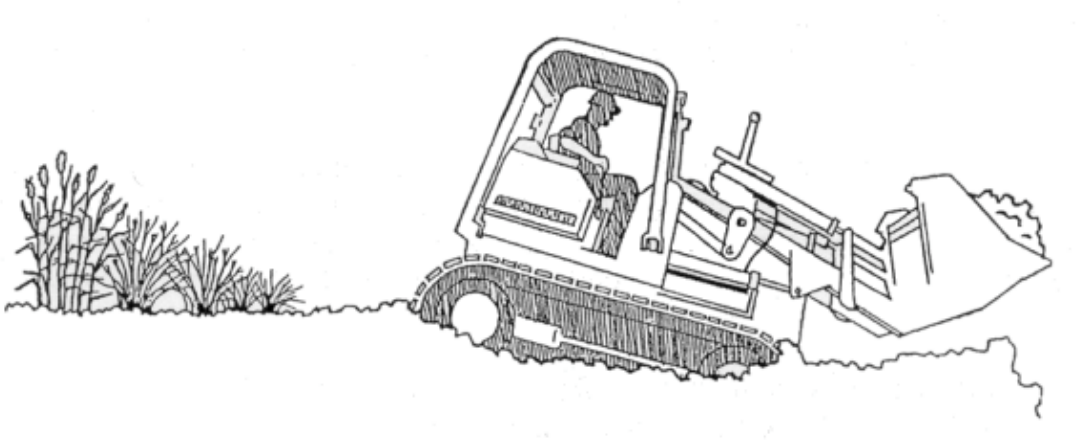
REGULATORY

and

ASSISTANCE

AGENCIES

SECTION III: REGULATORY AND ASSISTANCE AGENCIES FOR SAND AND GRAVEL OPERATORS IN MISSOURI



The most prevalent type of mining in Missouri, as far as the number of sites, is the in-stream removal of sand and gravel. Numerous operators across the state use sand and gravel deposits, (gravel bars) as a source of aggregate material. Local landowners use sand and gravel for personal use and a number of county governmental agencies use it as surfacing material for county and township roads.

There are five agencies that offer assistance and/or have various regulatory responsibilities for the in-stream sand and gravel removal activity.

- Missouri Department of Natural Resources;
    1) Land Reclamation Program
    2) Water Pollution Control Program
    3) Technical Assistance Program
- The Missouri Department of Conservation has a Landowners Assistance Program

- The U.S. Army Corps of Engineers (USACE) has regulatory oversight in certain situations. Please refer to the USACE maps in the attachment section for phone numbers of district offices where you may contact them.

If an individual intends to mine sand and gravel for sale on a commercial basis a permit **will** be required. You will need to contact the Missouri Department of Natural Resources' Land Reclamation Program, Water Pollution Control Program and the U.S Army Corps of Engineers.

The Missouri Department of Natural Resources' Land Reclamation Program (LRP), (573) 751-4041; operates under the authority of the 1972 Land Reclamation Act and regulates commercial in-stream mining operations. Incorporated into the Land Reclamation Act are rules that allow an operator to obtain a waiver from permitting through the Department of Natural Resources if the operator has obtained a permit from another agency whose permitting requirements are at least as stringent as those required by the department.

The Land Reclamation Program conducts field inspections of active operations and has the authority to issue enforcement actions against operators that have not obtained the necessary environmental permits or permitted operators who may be in violation of their stream protection plan that is incorporated into the permit.

Entities that are **not required** to obtain a permit from the LRP are:

(1) Individuals for personal use only, and;
(2) Political subdivisions including county, city, state or branch of the military that uses its own personnel and equipment to obtain materials.
(3) A commercial operator is exempt from permitting with the LRP if they are covered by a section 404 permit that is more strict than the LRP permit.

The Missouri Department of Natural Resources' Water Pollution Control Program (WPCP), (573) 751-1300; carries out section 401 of Public Law 95-217, the Clean Water Act of 1977. Under this authority, the WPCP reviews applications for Section 404 permits issued by the U.S. Army Corps of Engineers (USACE) for impacts to water quality and aquatic life and issues water quality certifications with conditions that ensure water quality is protected. The WPCP participated in the development of guidelines to protect water quality for the sand and gravel industry, and these guidelines are noted earlier in the document. In most cases, adherence to these guidelines would ensure a favorable water quality review. A copy of information sent to the USACE as application for the Section 404 permit should be sent to the department's WPCP, for the Section 401 review. If no Section 404 is required for the sand and gravel activity, then no Section 401 certification is required.

In addition, the WPCP is responsible for ensuring compliance with state Water Quality Standards, (10 CSR 20-7.031). This rule applies to in-stream mining and basically states that it is unlawful to discharge any contaminants into waters of the state, including those that violate the narrative criteria of the standards. If designated beneficial uses under the Clean Water Law are impaired or precluded by discharged materials, then the water quality standards have been violated.

The narrative criteria prohibit discharges that:

1) Form putrescent, unsightly, or harmful bottom deposits,
2) Create oil, scum, and floating debris,
3) Cause unsightly color or turbidity, or offensive odor,
4) Have a harmful effect on human, animal, or aquatic life.
5) Create a health hazard to humans from incidental contact,
6) Cause acute toxicity to livestock or wildlife watering,
7) Create physical, chemical or hydrologic changes that would impair the natural biological community and
8) Deposit used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste (unless deposit of the material is waived as a beneficial reuse.

Also, If your sand and gravel removal activity incorporates a gravel washing process, you are required to apply for a storm water discharge permit from the WPCP, Permits Section.

The Missouri Department of Natural Resources' Technical Assistance Program (TAP), (800) 361-4827 or (573) 526-6627; the Technical Assistance Program is a non-regulatory service of the Missouri Department of Natural Resources. Their mission is to provide information, assistance, education and training to business owners, farmers, local governments and the general public on how to control or reduce pollution. They also help people go beyond the minimum regulatory requirements to include environmental considerations as a central part of their planning and operations.

TAP's goal is to help citizens and local government agencies understand how and when to remove sand and gravel in an environmentally sound manner. On-site assistance is available to help landowners locate sites where material can be removed without adversely affecting the stream and water quality. We also help determine if a permit is required and offer assistance in completing the permit application that is submitted to the LRP.

Missouri Department of Conservation (MDC), (573) 751-4115; has no legal jurisdiction over in-stream mining activities, with the exception of using the Public Trust Doctrine. The doctrine states that human activities that negatively affect resources held in trust by government agencies for the public can be challenged legally. MDC and other Missouri agencies have not used the Doctrine at this time to compel public or private entities to use conservation minded resource practices. They have instead elected to work with the private landowners to implement approved conservation measures. The MDC also assists operators in finding locations where gravel could be removed that would cause the least amount of damage to the stream resources.

Operators should consult with the MDC and the U.S. Fish and Wildlife Service as to the presence of State and Federal threatened and Endangered Species in the

stream reach in order to avoid jeopardizing the species' continued existence or destroying or adversely modifying the habitat of such species.

U.S. Army Corps of Engineers (USACE) is responsible for regulating certain activities in Waters of the United States. USACE jurisdiction applies laterally over the entire surface of a water body to the ordinary high water mark (O.H.W.). The O.H.W. mark for inland fresh waters is the line on the shores established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris or other appropriate means that consider the characteristics of the surrounding areas. Section 10 or section 10/404 permits are required for construction activities in these waters.

The Corps also enforces Section 10 of the Rivers and Harbors Act of 1899 that extends over "navigable waters of the United States". These waters are administratively defined to mean waters that have been used in the past, are now used, or are susceptible to use as a means to transport interstate or foreign commerce, up to the head of navigation.

A section 10 permit would be required if navigational capacity is impacted by structures or work from small recreational docks to commercial docks and includes any dredging or excavation, as well as bank protection.

Section 404 of the Clean Water Act regulates activities in surface waters such as in-stream stockpiling, stream crossings, bank stabilization activities and select removal methods. Section 404 establishes a permit program to ensure that dredged and fill discharges comply with other state and federal environmental regulations.

Currently, in nonnavigable waters (Waters of the United States not under Section 10 of the Rivers and Harbors Act), excavation activities where the only discharge is incidental fallback of the excavated material into the hole from where it was taken, does not require Department of the Army (DA) Authorization.

The following activities are likely to result in a regulated discharge and do require a DA permit:

1. Instream (riverward of the ordinary high water mark) stockpiling for any amount of time, regardless how temporary.

2. Use of equipment that pushes gravel rather than lifting it.

3. Sloppy excavation that results in more than incidental fallback.

4. Instream processing/sorting where fines or oversized material is returned to the water body, is temporarily stockpiled in the channel, or is applied to river bank or bed for any purpose.

5. Construction of access ramps or crossings that require fill placement.

If there is a question that the USACE may have regulatory authority where you intend to remove sand and gravel, refer to the regional map in the attachments section for phone numbers and contact that office for assistance.

ATTACHMENTS

Attachments

Permit Application Supplement

Department of Natural Resources' Regional and Satellite Offices Map

Land Reclamation Mining Permit

Water Pollution Operating Permit (NPDES)

Corps of Engineers Districts

Outstanding National and State Resource Waters

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

MISSOURI STATE OPERATING PERMIT
WATER POLLUTION CONTROL PROGRAM

GENERAL DISCHARGE PERMIT

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No. MO-G500000

SAMPLE

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION
All Outfalls - SIC #1442

Settling basins/storm water runoff from sand and/or gravel washing.

This permit authorizes only wastewater, including storm waters, discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Section 644.051.6 of the Law.

April 12, 1996
Effective Date

Issue Date

John A. Young
Director, Division of Environmental Quality

April 11, 2001
Expiration Date

Director of Staff, Clean Water Commission

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS	PAGE NUMBER 2 of 4
	PERMIT NUMBER

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Outfall #001-Note 1						
Flow	MGD	*		*	once/month**	instantaneous estimate
Settleable Solids	mL/L/hr	1.5		1.0	once/month**	grab
pH - Units	SU	***		***	once/month**	grab
(continued below)						

MONITORING REPORTS SHALL BE SUBMITTED ANNUALLY; THE FIRST REPORT IS DUE _____ THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

B. STANDARD CONDITIONS

IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED Part I STANDARD CONDITIONS DATED October 1, 1980, AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.

MO 780-0010 (8/91)

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

* Monitoring requirement only.

** Sample shall be collected monthly during periods of operation. Monitoring reports shall also be submitted during periods when the facility is not in operation or when there is no discharge from the treatment facility.

*** pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6.0-9.0 pH units.

Note 1 - Permittee shall submit a map once per year with the annual report to the department showing the area(s) being mined, current stockpile areas, equipment storage and maintenance areas, and outfalls. Future planned areas and outfalls should be noted as appropriate.

APPLICABILITY

1. This permit authorizes the discharge of water to waters of the state from stormwater runoff from sand and gravel operations and wastewater from washing gravel and/or sand within the state of Missouri.

2. Holders of current individual NPDES permits who desire to apply for inclusion under this general permit should contact the Department for application requirements.

3. If at any time, the Missouri Department of Natural Resources determines that the quality of waters of the state may be better protected by requiring the owner of sand and/or gravel operations to apply for an individual NPDES permit, the Department may do so.

4. If at any time the owner of a sand and/or gravel operation should desire to apply for an individual NPDES permit, the owner may do so.

5. This permit does not authorize any dredging operations.

6. This permit is not transferable to other owners or operators.

7. This permit does apply to truck washing operations that include the use of soap or detergents. Truck washing that does not involve the use of soap or detergents is allowed as long as limitations are achieved.

Requirements

1. General Criteria. The following water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:

   (a) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses;
   (b) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;
   (c) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;
   (d) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life;
   (e) There shall be no significant human health hazard from incidental contact with the water;
   (f) There shall be no acute toxicity to livestock or wildlife watering;
   (g) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community;
   (h) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247;

2. Permittee must provide sediment and erosion control sufficient to prevent or control pollution to waters of the state. This could include the use of straw bales, silt fences, or sediment basins, if needed, to comply with effluent limits.

3. Permittee shall adhere to the following Best Management Practices:

   a. Prevent the spillage or loss of fluids, oil, grease, fuel, etc. from vehicle maintenance, equipment cleaning, or warehousing activities and thereby prevent the contamination of storm water from these substances.

   b. Provide collection facilities and arrange for proper disposal of waste products including but not limited to petroleum waste products, and solvents. All fueling facilities present on the site shall adhere to applicable federal and state regulations concerning underground storage, above ground storage, and dispensers, including spill prevention, control and counter measures.

Requirements (continued)

3. Permittee shall adhere to the following Best Management Practices: (continued)

   c. Store all paint, solvents, petroleum products, and petroleum waste products (except fuels), and storage containers (such as drums, cans, or cartons) so that these materials are not exposed to storm water.

   d. Provide good housekeeping practices on the site to keep trash from entering waters of the state.

   e. Designate an individual as responsible for environmental matters. Provide for inspection by facility staff, once a month on workdays, of any structures that function to prevent pollution from storm water or to remove pollutants from storm water and of the facility in general to ensure that any Best Management Practices are continually implemented and effective.

Termination of Permit

If activities covered by this permit have ceased and this permit no longer applies, the permittee shall request termination of this permit. The permittee shall submit Form H, Termination of a General Permit.

Table D
Outstanding National Resource Waters

Stream	Location
Current River	Headwaters to Northern Ripley Co. Line
Jacks Fork River	Headwaters to Mouth
Eleven Point River	Headwaters to Hwy. 142

Table E
Outstanding State Resource Waters

Waterbody	Miles/Acres	Location	County(ies)
Baker Branch	4 mi.	Taberville Prairie	St. Clair
Bass Creek	1 mi.	in Three Creek Conservation Area	Boone
Big Buffalo Creek	1.5 mi.	Big Buffalo Creek Conservation Area	Benton-Morgan
Big Creek	5.3 mi.	Sam A. Baker State Park	Wayne
Big Sugar Creek	7 mi.	Cuivre River State Park	Lincoln
Big Lake Marsh	150 ac.	Big Lake State Park	Holt
Blue Springs Creek	4 mi. (1.5 mi. adjacent to owned lands)	Blue Spring Creek Conservation Area	Crawford
Boone Femme Creek	2 mi.	Three Creeks Conservation Area	Boone
Brush Creek	0.7 mi.	Bonanza Conservation Area	Caldwell
Bryant Creek	1.5 mi.	Bryant Creek Natural Area in Rippee Conservation Area	Ozark/Douglas
Cathedral Cave Branch	5 mi.	Onondaga Cave State Park	Crawford
Chariton River	9.8 mi.	Rebels Cove Conservation Area	Putnam-Schuyler
Chloe Lowry Marsh	40 ac.	Chloe Lowry Marsh Conservation Area	Mercer
Coakley Hollow	1.5 mi.	Lake of the Ozarks State Park	Camden
Coonville Creek	2 mi.	St. Francois State Park	St. Francois
Courtois Creek	12 mi.	Mouth to Hwy. 8	Crawford
Crabapple Creek	1.0 mi.	Bonanza Conservation Area	Caldwell
Devils Ice Box Cave Branch	1.5 mi.	Rock Bridge State Park	Boone
East Fork Black River	3 mi.	Johnson's Shut-Ins State Park	Reynolds
First Nicholson Creek (East Drywood Creek)	2 mi.	Prairie State Park	Barton
Gan's Creek	3 mi.	Rock Bridge State Park	Boone
Huzzah Creek	6 mi.	Mouth to Hwy. 8	Crawford
Indian Creek	17.5 mi.	Mark Twain National Forest	Douglas-Howell
Ketchum Hollow	1.5 mi.	Roaring River State Park	Barry
Little Piney Creek	25 mi.	Mouth to 21,35N,08W	Phelps
Little Black River	3 mi.	Mud Puppy Natural History Area S22,T24N,R3E to S25,T24N,R3E	Ripley
Log Creek	0.4 mi.	Bonanza Conservaton Area	Caldwell
Meramec River	8 mi.	Adjacent to Meramac State Park	Crawford/Franklin
Meramec River	3 mi.	Adjacent to Onondaga and Huzzah State Forest	Crawford
Mill Creek	5 mi.	Mark Twain National Forest	Phelps
N. Fork White River	5.5 mi	Mark Twain National Forest	Ozark
Noblett Creek	5 mi.	Above Noblett Lake, Mark Twain National Forest	Douglas-Howell
Onondaga Cave Branch	0.6 mi.	Onondaga Cave State Park	Crawford
Pickle Creek	3 mi.	Hawn State Park	Ste. Genevieve
S. Prong L. Black River	2 mi.	In Little Black Conservation Area	Ripley
Shoal Creek	0.5 mi.	Bonanza Conservation Area	Caldwell
Spring Creek	17 mi.	Mark Twain National Forest	Douglas
Spring Creek	6.5 mi.	Mark Twain National Forest	Phelps
Taum Sauk Creek	5.5 mi.	Johnson's Shut-Ins State Park Addition S23,T33N,R2E to S5,T33N,R3E	Reynolds-Iron
Turkey Creek	4.6 mi.	In Three Creeks Conservation Area	Boone
Van Meter Marsh	80 ac.	Van Meter State Park	Saline
Whetstone Creek	5.1 mi.	Whetsone Creek Conservation Area	Callaway